A State-of-the-Art Review on Image Synthesis With Generative Adversarial Networks

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Abstract

Generative Adversarial Networks (GANs) have achieved impressive results in various image synthesis tasks, and are becoming a hot topic in computer vision research because of the impressive performance they achieved in various applications. In this paper, we introduce the recent research on GANs in the field of image processing, including image synthesis, image generation, image semantic editing, image-to-image translation, image super-resolution, image inpainting, and cartoon generation. We analyze and summarize the methods used in these applications which have improved the generated results. Then, we discuss the challenges faced by GANs and introduce some methods to deal with these problems. We also preview some likely future research directions in the field of GANs, such as video generation, facial animation synthesis and 3D face reconstruction. The purpose of this review is to provide insights into the research on GANs and to present the various applications based on GANs in different scenarios.